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IEEE International Symposium on Computer-Aided Control System Design

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FOREWORD

On behalf of the IEEE Control Systems Society, the Operating and Program Committees, and all of the other numerous volunteers involved, I would like to welcome you to the 1996 CCA/ISIC/CACSD. This is a truly unique event, combining three well-established meetings into one event for the first time. The luxurious Ritz-Carlton, Dearborn, is the setting for the conference.

More than three years ago, when I first agreed to be General Chair for the fifth annual 1996 IEEE Conference on Control Applications, we decided on a conference theme (traditional for the CCA) of automotive control systems; thus the obvious choice of location was the Detroit area. At that time, three factors affected my early planning and organization for the meeting: (i) there would be no ACC (American Control Conference) in 1996; (ii) the CDC (Conference on Decision and Control) would be in Japan in 1996; and, (iii) the submission deadline for the IFAC World Congress (in San Francisco, June 1996) was to be a full one year before the congress. Then, late in 1993, the Executive Committee of the IEEE Control Systems Society approached me with the proposal of joining the annual International Symposium on Intelligent Control with the CCA in 1996. It seemed like a marvelous suggestion, and the one-time marriage was formed. Then in early 1994, the Computer-Aided Control System Design Technical Committee, unaware of the ISIC arrangement, contacted me about joining the bi-annual CACSD Symposium with the CCA in 1996. Although it seemed like a great idea, my concern at that time was the size of the hotel and adequate meeting space. A four-day venue was created, and we were able to work out a program suitable to everyone. The end result was that authors wishing to submit a paper after June 1995 to a 1996 control systems conference in the US had only one choice: the 1996 CCA/ISIC/CACSD!

Coordination of three operating committees, three program committees, and unique issues concerning the technical program and joint conference proceedings, made this conference a challenge to organize. With the assistant of an excellent group of people serving in the various positions to organize the event, my main job has been to keep things moving along appropriate timelines amongst the CCA, ISIC, and CACSD, and, of course, to handle the vast variety of hotel and local arrangements. As for social functions, all attendees are invited to the opening reception on Sunday evening, September 15, at the Ritz-Carlton. I am happy to say that the Ford Foundation is sponsoring our conference banquet on Monday evening (September 16) at the world-famous Henry Ford Museum; conference attendees will be exclusive guests of the museum for the evening. As for the technical program, three plenary lectures will be delivered on the first three mornings, while on the fourth day some special panel sessions will be held. Monday through Wednesday will see eight parallel tracks of sessions, intermingling CCA, ISIC, and CACSD themes. Three top-drawer tutorials will be held on Sunday, alongside three parallel CACSD tracks of sessions, and an equally good post-conference workshop will be held to close the event on Thursday, September 19.

From the CCA viewpoint, this year's conference offers another strong program in the tradition of the CCA. The first CCA, held in Dayton in 1992, had a theme of Aerospace Control. The second, held in Vancouver, featured the pulp and paper industry. The third, held in Glasgow, focused on industrial process control, while the fourth, held in Albany, featured power systems. This year's conference, although having a theme of automotive systems, features a broad variety of control applications, having entire sessions devoted to each of the above themes from previous CCAs. A special addition this year is the presence of several ASME-organized sessions, as we attempt to broaden our interaction with colleagues across the engineering disciplines in a spirit of cooperation.

We are confident that all attendees will enjoy a comfortable social setting, as well as a stimulating technical program. Welcome to all!

Steve Yurkovich, General Chair

Biography of CCA Plenary Speaker

William F. Powers has been with the Ford Motor Company since 1979. On February 1, 1996, Mr. Powers assumed the responsibilities of Vice President-Research. He had been Executive Director of Information Technology and Ford Research Laboratory since August 1994 and Executive Director of Ford Research Laboratory since February 1991. After serving in numerous Research Laboratory positions, he became the first Director of Product and Manufacturing Systems in North American Automotive Operations in 1987. He was appointed Program Manager, Car Product Development Specialty Car Programs in 1989, where he was responsible for the Thunderbird, Cougar, and Mark VIII vehicles. Dr. Powers received his B.S. in Aerospace Engineering in 1963 from the University of Florida, and his Ph.D. in Engineering Mechanics in 1968 from the University of Texas at Austin. At NASA Marshall Space Flight Center form 1960-65, he was involved with the development of the Saturn Booster guidance system and Apollo mission analyses. He consulted on the Space Shuttle Program with the NASA Johnson Space Center during the period 1970-79. From 1968-80, he was a Professor of Aerospace Engineering and Computer, Information and Control Engineering at the University of Michigan. He has served as Editor of the Journal of the Astronautical Sciences and Associate Editor of the AIAA Journal of Spacecraft and Rockets, Journal of Optimization Theory and Applications, Optimal Control Applications and Methods, IEEE Transactions on Automatic Control, and Control Systems Magazine. He also served as President of the American Automatic Control Council (1988-89) and Chairman of the National Science Foundation Advisory Council for Electrical, Communications and Systems Engineering (1988-89). He is a member of the National Academy of Engineering, a Fellow of the Institute of Electrical and Electronics Engineers, a foreign member of the Royal Swedish Academy of Engineering Sciences, a member of the ITS America Board of Directors, and a member of advisory committees for Purdue and the Universities of Illinois and Texas, and the Department of Energy Defense Laboratories. He also serves on SAE's Emerging Technologies Advisory Board, and is a participant in NRC's Japan Competitiveness Task Force.

1996 CCA/ISIC/CACSD
Program-at-a-Glance

Sunday 9/15/96	Salon I	Salon II	Salon III	Salon V	Salon VI	Salon VII	Delegate	Director's
9:00am to 10:00am	*CACSD Plenary Presentation - The Plaza Room* **"Control of Automotive Systems" Mr. Dennis Bogden, GM Powertrain Group**							
10:30am to 11:50am	***CACSD*** Knowledge Based CACSD	***CACSD*** Hybrid Systems and Supervisory Control	***CACSD*** Automotive and Vehicle Control	**CCA Tutorial**	**CCA Tutorial**	**ISIC Tutorial**		
1:30 pm to 3:30 pm	***CACSD*** Numerical Algorithms & Software for CACSD I	***CACSD*** CACSD for Fault Detection Applications	***CACSD*** Rapid Automotive Control Prototyping and Testing	"Fault Detection and Diagnosis with Automotive Applications"	"Design of Robust Adaptive Systems"	"Neural Networks for Intelligent Control"		
4:00 pm to 5:40 pm	***CACSD*** Numerical Algorithms and Software for CACSD II	***CACSD*** CACSD Synthesis and Analysis	***CACSD*** CACSD for Manufacturing Systems	G. Rizzoni	P. Ioannou, Y. Zhang, and J. Sun	K. Narendra and V. Venkataraman		

Monday 9/16/96	Salon I	Salon II	Salon III	Salon V	Salon VI	Salon VII	Delegate	Director's
8:30am to 9:30am	*CCA Plenary Presentation - The Plaza Room* **"What Does The Customer Really Want?" Dr. William F. Powers, Ford Research Laboratory**							
10:00am to 11:40am	***CACSD*** Algorithms & Software Tools for LMI Problems in Control	***CCA*** Aircraft Control	***CACSD*** VHDL-A: A Candidate for Uniform Modeling	***ISIC*** Navigation	***ISIC*** Applications of Fuzzy Control	***CCA*** Robotic Control I	***CACSD*** CACSD for Nonlinear Systems	***ISIC*** Intelligent Control Theory
1:30 pm to 3:30 pm	***CACSD Panel*** CACSD Tools and Methodologies The User's View	***CCA*** Automotive Chassis Control	***CCA*** Intelligent Control for Industrial Applications-A Celebration of Diversity	***ISIC*** Learning Control Systems	***ISIC*** Fuzzy Control I	***CCA*** Aircraft Dynamics, Control and Simulation *(Organized by ASME)*	***CCA*** Paper Machine Control	***ISIC*** Intelligent Control Applica-tions I
4:00 pm to 5:40 pm	***CACSD*** Optimization Based CACSD	***CCA*** Optimal Control	***CACSD*** Integrated CASE/ CACSD for Real-Time Systems	***ISIC*** Neural Identification and Control	***ISIC*** Estimation, Prediction and Detection	***CCA*** Robotic Control II	***CACSD*** Hybrid Systems Modeling and Simulation	***ISIC*** New Directions in Intelligent Control

Tuesday 9/17/96	Salon I	Salon II	Salon III	Salon V	Salon VI	Salon VII	Delegate	Director's
8:30am to 9:30am	*ISIC Plenary Presentation - The Plaza Room* **"Intelligent Autonomous Control: From Theory to Applications"** **Prof. Panos Antsaklis, University of Notre Dame**							
10:00am to 11:40am	*CACSD* Matlab Toolkits	*CCA* Fuzzy/ Neural Networks	*CCA* Nonlinear Systems I	*ISIC* Fuzzy Control Design and Analysis	*ISIC* Neural Control Techniques	*CCA* Flexible Structures I	*CACSD* Data-, Model-, & Process Management	*CCA* Identification I
1:30 pm to 3:30 pm	*CACSD* Scilab: A Freeware Alternative for CACSD	*CCA* Applications of Sliding Mode Control *(Organized by ASME)*	*CCA* Vibration Control Via Command Shaping *(Organized by ASME)*	*ISIC* Fuzzy Control II	*ISIC* Hybrid Systems	*CCA* Laboratory Experiments in Control Applications *(Organized by ASME)*	*CACSD* CACSD Integration Support	*CCA* Control of Power Systems in a Deregulated Environment
4:00 pm to 5:40 pm	*CACSD* Symbolic Algorithms for CACSD	*CCA* Manufacturing Systems and Machine Tool Control	*CCA* Nonlinear Systems II	*ISIC* Genetic Algorithms	*ISIC* Neural Networks In Process Control	*CCA* Robust Control I	*CACSD* Mechatronics CACSD	*CCA* Identification II

Wed. 9/18/96	Salon I	Salon II	Salon III	Salon V	Salon VI	Salon VII	Delegate	Director's
9:30am to 11:30am	*ASME Panel* Control System Needs of the Automotive Industry	*CCA* Intelligent Controls	*CCA* Motor Control I	*ISIC* Neuro Control of Automotive Systems	*CCA* Sliding Mode Control	*CCA* Robotic Control III	*ISIC* Intelligent Control Applications II	*CCA* Power Systems Control
1:00 pm to 3:00 pm	*IEEE Panel* Role of Control in Future Engineering	*CCA* Automotive Powertrain Control	*CCA* Analysis & Control of Systems with Nonlinear Friction *(Organized by ASME)*	*ISIC* Neural Networks Theory	*CCA* Process Control	*CCA* Motor Control II	*CCA* Linear Systems	*CCA* Noise and Vibration Control
3:15 pm to 4:55 pm	*ISIC* Stability of Intelligent Systems	*CCA* Flexible Structures II	*CCA* Fault Detection, Diagnostics	*ISIC* Neural Networks for Control	*CCA* Adaptive Control	*CCA* Robust Control II	*ISIC* Robotic Systems	*CCA* Applications

Post-Conference ISIC Workshop

"Architectures for Intelligent Control"

Organizers:	**J. Albus and A. Meystel**
Date:	**Thursday, September 19**
Time:	**8:00 am - 4:00 pm**
Room:	**Salon VII**

The Plaza Room

CCA Plenary Presentation
8:30 - 9:30

What Does the Customer Really Want?

Powers, William F. — Ford Research Lab.

Chair: Yurkovich, Stephen — The Ohio State Univ.
Co-chair: Winkelman, Jim — Ford Motor Company

Salon II

CCA-MA2
Aircraft Control
Chair: Yedavalli, R.K. — The Ohio State Univ.
Co-chair: Lyashevsky, Sergey — Purdue Univ. at Indianapolis

10:00 - 10:20
Optimal Setpoint Controller for a Generic X-29a Aircraft with Forebody Vortex Nozzles 1
Valasek, John — Western Michigan Univ.

10:20 - 10:40
Model-Following Control of a Helicopter in Hover 7
Trentini, Michael,
Pieper, Jeff K. — Univ. of Calgary

10:40 - 11:00
Multi-Objective Controller Design via Optimal Interpolation with an Aircraft Control Application 13
Önyelioglu, Konur,
Özbay, Hitay — The Ohio State Univ.
Garg, Sanjay — NASA Lewis Research Center
Uzman, Baris — The Ohio State Univ.

11:00 - 11:20
Phase Compensation of Rate Limiters in Unstable Aircraft 19
Rundqwist, Lars,
Ståhl-Gunnarsson, Karin — SAAB Military Aircraft

11:20 - 11:40
Robust Flight Control of Aircraft in the Presence of Uncertainties 25
Lyashevskiy, Sergey — Purdue Univ. at Indianapolis

Salon VII

CCA-MA6
Robotic Control I
Chair: Meckl, Peter H. — Purdue Univ.
Co-chair: Lin, Feng — Wayne State Univ.

10:00 - 10:20
An Optimal Control Approach to Robust Control of Robot Manipulators 31
Lin, Feng — Wayne State Univ.
Brandt, Robert D. — Intelligent Devices, Inc.

10:20 - 10:40
Cooperative Task-Space Control with Kinetostatic Filtering of a Two-Manipulator System 37
Caccavale, Fabrizio,
Chiacchio, Pasquale,
Chiaverini, Stefano — Univ. degli Studi Di Napoli

10:40 - 11:00
Control of an Underwater Robot System Connected to a Ship by a Slender Marine Structure 43
Schjølberg, Ingrid,
Egeland, Olav — Univ. of Trondeim

11:00 - 11:20
Tracking Control Design Combined Robust and Adaptive Scheme for Flexible Joint Manipulators 1112
Kim, D.H.,
Lee, Kyo-Il — Seoul Nat. Univ.

Salon II

CCA-MM2
Automotive Chassis Control
Chair: Rhode, Doug — Ford Motor Co.
Co-chair: Nair, Satish — Univ. of Missouri-Columbia

1:30 - 1:50
Optimal Fuzzy Logic Control for an Anti-Lock Braking System 49
Sobottka, Christian,
Singh, Tarunraj — SUNY at Buffalo

1:50 - 2:10
Selection of Sensors and Actuators for an Active Suspension Control Problem 55
van de Wal, Marc,
de Jager, Bram — Eindhoven Univ. of Tech.

2:10 - 2:30
Nonlinear Indirect Adaptive Control of a Quarter Car Active Suspension 61
Kim, Eung-Seok — Samsung Adv. Inst. of Tech.

2:30 - 2:50
Stabilization of Wheeled Vehicles by Hybrid Nonlinear Time-Varying Feedback Laws 67
Al-Regib, Emad,
Kolmanovsky, Ilya,
McClamroch, N. Harris — Univ. of Michigan

2:50 - 3:10
Multivariable Frequency Domain Analysis for Automotive Vehicle Ride Control 73
Potter, T.E.C. — Univ. of Warwick
Cherry, A.S. — Univ. of Manchester
Jones, R.P. — Univ. of Warwick

3:10 - 3:30
Robust and Failure Tolerant Control of Lateral Vehicle Motion Using Stochastic Robustness 79
Ray, Laura R. — Christian Brothers Univ.

Salon III

CCA-MM3

Intelligent Control for Industrial Applications -A Celebration of Diversity

Chair: Haissig, Christine,
Co-chair: Samad, Tariq — Honeywell Inc.
Organizer: Haissig, Christine,
Organizer: Samad, Tariq — Honeywell Inc.

1:30 - 1:50 (I)
Tuning Fuzzy Feedback Controllers Using the Circle Criterion 85
Haissig, Christine — Honeywell Inc.

1:50 - 2:10 (I)
Advances in Appliance Control: The Breaking of a Paradigm 91
Okey, M. Christopher — Honeywell Inc.
Ruane, Peggy M. — Honeywell Micro Switch

2:10 - 2:30 (I)
An Operator's Model for Control and Optimization of Industrial Processes 95
Kim, S.,
Mahmood, W.,
Vachtsevanos, George J. — Georgia Inst. of Tech.
Samad, Tariq — Honeywell Tech. Center

2:30 - 2:50 (I)
Functional-Link Net Modeling and Evolutionary Optimization for Closed-Loop Supervisory Process Control ..... *
Cass, Ronald — AI Ware

2:50 - 3:10 (I)
Neural Architectures and Algorithms for Dynamic Pattern Recognition & Control ..... *
Unnikrishnan, K.P. — California Inst. of Tech.

3:10 - 3:30 (I)

Panel Discussion:

The Diversity of Intelligent Control

Moderators

Samad, Tariq,
Haissig, Christine — Honeywell Tech. Center

Panelists

Haissig, Christine — Honeywell Inc.
Okey, M. Christopher — Honeywell Inc.
Vachtsevanos, George J. — Georgia Inst. of Tech.
Cass, Ronald — AI Ware
Unnikrishnan, K.P. — California Inst. of Tech.

Salon VII

CCA-MM6

Aircraft Dynamics, Control and Simulation

Chair: Joshi, Suresh M. — NASA Langley Research Center
Co-chair: Kelkar, Atul G. — Kansas State Univ.
Organizer: Kelkar, Atul G. — Kansas State Univ.
Organizer: Joshi, Suresh M. — NASA Langley Research Center
Organized by ASME

1:30 - 1:50 (I)
Application of Gain Scheduled Eigenstructure Assignment to Flight Control Design 101
Piou, Jean E. — MIT Lincoln Lab
Sobel, K.M. — The City College of New York

1:50 - 2:10 (I)
Tailless Aircraft Control Law Design Using Dynamic Inversion and Mu-Synthesis 107
Ngo, Anhtuan D.,
Reigelsperger, William C.,
Banda, Siva S. — Wright-Patterson Air Force Base
Bessolo, John A. — Lockheed Martin Tactical Aircraft Systems

2:10 - 2:30 (I)
Control of Aeroelastic Dynamics by Smart Structures via Matrix Second Order Framework 113
Yedavalli, R.K.,
Tseng, Y.W. — The Ohio State Univ.

2:30 - 2:50 (I)
Aircraft/Control System Simulation 119
Thompson, J. Garth — Kansas State Univ.

2:50 - 3:10 (I)
Experimental Validation of Generalized Predictive Control for Active Flutter Suppression 125
Haley, Pamela J.,
Soloway, Donald — NASA Langley Research Center

3:10 - 3:30 (I)
Inner Loop Control of Supersonic Aircraft in the Presence of Aeroelastic Modes 130
Joshi, Suresh M. — NASA Langley Research Center
Kelkar, Atul G. — Kansas State Univ.

Delegate

CCA-MM7

Paper Machine Control

Chair: Gorinevksy, Dimitry,
Co-chair: Heaven, Michael — Measurex Devron, Inc.
Organizer: Gorinevksy, Dimitry,
Organizer: Heaven, Michael — Measurex Devron, Inc.

1:30 - 1:50 (I)
Paper Machine Multivariable Process Control and Tuning ..*
He, X.G.,
Tao, M.,
Balakrishnan, R.,
Wang, F. — Measurex Corp.

1:50 - 2:10 (I)
A Color Measurement and Control System for Paper-Making Processes 136
Chen, Shih-Chin,
Murphy, Timothy F.,
Subbarayan, Ravi — ABB Ind. Sys. Inc.

2:10 - 2:30 (I)
Performance Analysis of Cross-Direction Process Control Using Multivariable and Spectral Models 143
Gorinevsky, Dimitry,
Heaven, Michael,
Vyse, R. — Measurex Devron Inc.

2:30 - 2:50 (I)
Minimizing the Range of Cross-Directional Variations in Basis Weight on a Paper Machine 149
Duncan, S.R.,
Corrscadden, K.W. — UMIST

2:50 - 3:10 (I)
Robust Cross-Directional Control of Large Scale Paper Machines 155
Braatz, R.D.,
VanAntwerp, J.G. — Univ. of Illinois at Urbana-Champaign

3:10 - 3:30 (I)
Paper Machine Data Compression Using Wavelets 161
Nesic, Zoran,
Davies, Michael S. — Univ. of British Columbia
Dumont, Guy A. — The Univ. of British Columbia

Salon II

CCA-MP2
Optimal Control
Chair: Mestha, L.K. — Xerox Corporation
Co-chair: Bernstein, Dennis — Univ. of Michigan

4:00 - 4:20
Time-Optimal Control of Robotic Manipulators with Uncertain Dynamics and Constraints 167
Lyashevskiy, Sergey,
Chen, Yaobin — Purdue Univ. at Indianapolis

4:20 - 4:40
Determination of a Strategy for Optimal Observations with a Visual System .....
Benameur, K.,
Belanger, P.R. — McGill Univ.

4:40 - 5:00
Design of Stable Closed Loop Systems with Uncertainties and Estimate Performance Variations 173
Liu, Jun — Nanyang Tech. Univ.

5:00 - 5:20
Finite Settling Time Control of the Double Integrator Using a Virtual Trap-Door Absorber 179
Bupp, Robert T.,
Bernstein, Dennis — Univ. of Michigan
Chellaboina, Vijaya,
Haddad, Wassim M. — Georgia Inst. of Tech.

5:20 - 5:40
Continuous, Bounded, Finite-Time Stabilization of the Translational and Rotational Double Integrators 185
Bhat, Sanjay P.,
Bernstein, Dennis — Univ. of Michigan

Salon VII

CCA-MP6
Robotic Control II
Chair: Simon, Daniel — TRW Test Lab
Co-chair: Sivashankar, N. — Ford Motor Company

4:00 - 4:20
Modeling and Control of the Longitudinal and Lateral Dynamics of a Series Hybrid Vehicle 191
Wältermann, Peter — Univ. of Paderborn

4:20 - 4:40
Commanding Sensors and Controlling Indoor Autonomous Mobile Robots 199
Dekhil, Mohamed,
Sobh, Tarek M.,
Efros, Alexei A. — Univ. of Utah

4:40 - 5:00
Experiments of Impedance Control on an Industrial Robot Manipulator with Joint Friction 205
Bruni, F.,
Caccavale, Fabrizio,
Natale, C.,
Villani, Luigi — Univ. degli Studi Di Napoli

5:00 - 5:20
Experimental Evaluation of a Complete Hybrid Position and Force Task Using a Two-Link Manipulator 211
Bossert, David E.,
Ly, Uy-Loi,
Vagners, Juris — Univ. of Washington

5:20 - 5:40
A Redundant Manipulator Research Testbed 217
Silver, David,
Barbieri, Enrique — Tulane Univ.

Salon II

CCA-TA2
Fuzzy/Neural Networks
Chair: Chowdhury, Fahmida — Michigan Tech Univ.
Co-chair: Ting, Thomas — General Motors Corp.

10:00 - 10:20
Gaussian Networks for Control of a Class of Systems with Friction 223
Du, Hongliu,
Vargas, Victor,
Nair, Satish S. — Univ. of Missouri-Columbia

10:20 - 10:40
Applying Neuro-Fuzzy Modelling and Control to MD Moisture Content Systems in Paper Machines 229
Wang, Hong — UMIST

10:40 - 11:00
Modeling and Intelligent Chatter Control Strategies for a Lathe Machine 235
Pan, G., Xu, H., Kwan, C.M. — Intelligent Autom. Inc.
Liang, C. — San Diego State Univ.
Haynes, L. — Intelligent Autom. Inc.
Geng, Z. — Robotronics

11:00 - 11:20
Fuzzy TBT Control of Multi-Stage Flash Desalination Plants 241
Ismail, Abdulla, Abu-Khousa, Emad — United Arab Emirates Univ.

11:20 - 11:40
Fuzzy Logic Control of a Positioning Table with DSP Real-Time Implementation 247
Wang, Mingheng, Chen, Yaobin — Purdue Univ. at Indianapolis

Salon III

CCA-TA3
Nonlinear Systems I
Chair: Sun, Jing — Ford Motor Co.
Co-chair: Chang, Man-Feng — Research & Development Center

10:00 - 10:20
Robust Control Design for a Class of Nonlinear Uncertain Systems with Application to Missiles 253
Kaloust, Joseph, Schroeder, Wayne — Lokheed Martin Vought Systems

10:20 - 10:40
Nonlinear Control of a Swing-Up Inverted Pendulum 259
Torres-Pomales, W. — NASA Langley Research Center
González, Oscar R. — Old Dominion Univ.

10:40 - 11:00
A Preliminary Control Design for the Nonlinear Benchmark Problem 265
Mracek, Curtis P., Cloutier, James R. — U.S. Air Force Armament Dir.

11:00 - 11:20
Habituating Control for Non-Square Nonlinear Processes 273
McLain, Richard B., Kurtz, Michael J., Henson, Michael A. — Louisiana State Univ.
Doyle III, Francis J. — Purdue Univ.

11:20 - 11:40
Experimental Implementation of Integrator Backstepping and Passive Nonlinear Controllers for the RTAC Testbed 279
Bupp, Robert T., Bernstein, Dennis, Coppola, Vincent T. — Univ. of Michigan

---

Salon VII

CCA-TA6
Flexible Structures I
Chair: Yen, Gary G. — USAF Phillips Lab.
Co-chair: Yousefi-Koma, Aghil — Carleton Univ.

10:00 - 10:20
Eigenvalue Assignment of Unified Systems with Slow and Fast Modes 285
Singh, Hardev — Univ. of Idaho
Naidu, D. Subbaram — Idaho State Univ.
Peterson, James N. — Univ. of Idaho

10:20 - 10:40
On the Feedback Control of the Wave Equation 291
Alli, Hasan, Singh, Tarunraj — SUNY at Buffalo

10:40 - 11:00
A Non-Collocated Active Traveling Wave Control of Smart Structures Using Distributed Transducers 297
Vukovich, George — Canadian Space Agency
Yousefi-Koma, Aghil — Carleton Univ.

11:00 - 11:20
Unified Predictive Control of Contact Force in Flexible Link Manipulators 303
Alasty, Aria — Carleton Univ.
Vukovich, George — Canadian Space Agency

11:20 - 11:40
Tip Tracking Control of a Flexible Manipulator Using PD Type Controller 309
Ge, Shuzhi S., Lee, T.H., Zhu, G. — Nat. Univ. of Singapore

Director's

CCA-TA8
Identification I
Chair: Samad, Tariq — Honeywell Inc.
Co-chair: Cloutier, James R. — U.S. Air Force Armament Dir.

10:00 - 10:20
Discrete-Time Sliding Modes Observers for Induction Motors 314
Caminhas, W.M., Takahashi, Ricardo H.C. — UFMG
Peres, Pedro L.D., Tavares, H.M.F. — Univ. of Campinas

10:20 - 10:40
On Metric Observers for Nonlinear Systems 320
Lohmiller, Winfried, Slotine, Jean-Jacques — Massachusetts Inst. of Tech.

10:40 - 11:00
Nonlinear Identification of Aircraft 327
Lyashevskiy, Sergey, Chen, Yaobin — Purdue Univ. at Indianapolis

11:00 - 11:20
A Nonlinear Observer for the Inverted Pendulum 332
Eker, J.,
Åström, Karl J. — Lund Inst. of Tech.

11:20 - 11:40
A New Technique for Nonlinear Estimation 338
Mracek, Curtis P.,
Cloutier, James R.,
D'Souza, Christopher A. — U.S. Air Force Armament Dir.

Salon II

CCA-TM2
Applications of Sliding Mode Control
Chair: Hedrick, J. Karl — Univ. of California Berkley
Co-chair: Misawa, Eduardo A. — Oklahoma State Univ.
Organizer: Misawa, Eduardo A. — Oklahoma State Univ.
Organized by ASME

1:30 - 1:50 (I)
Sliding Mode Observers for Automotive Applications 344
Drakunov, Sergey — Tulane Univ.
Utkin, Vadim — The Ohio State Univ.
Zarei, Shahram,
Miller, John — Ford Motor Co.

1:50 - 2:10 (I)
Model-Based Cylinder-By-Cylinder Air-Fuel Ratio Control for SI Engines Using Sliding Observers 347
Shiao, Yaojung,
Moskwa, John J. — Univ. of Wisconsin-Madison

2:10 - 2:30 (I)
Application of Sliding Mode Observers to Automobile Powertrain Diagnostics 355
Krishnaswami, Vasanth,
Siviero, C.,
Carbognani, F.
Rizzoni, Giorgio,
Utkin, V. — The Ohio State Univ.

2:30 - 2:50 (I)
A Robust Optimal Lateral Vehicle Control Strategy 361
Pham, Hung,
Hedrick, J. Karl — Univ. of California-Berkeley

2:50 - 3:10 (I)
Intelligent Sliding Mode Control of Cutting Forces During Single-Point Turning Operations .....
Buckner, Gregory D.,
Fernandez-Rodriguez, B. — Univ. of Texas at Austin

3:10 - 3:30 (I)
Applications of Metric Observers for Nonlinear Systems .367
Lohmiller, Winfried,
Slotine, Jean-Jacques — Massachusetts Inst. of Tech.

Salon III

CCA-TM3
Vibration Control via Command Shaping
Chair: Meckl, Peter H. — Purdue Univ.
Co-chair: Singer, Neil — Convolve, Inc.
Organizer: Meckl, Peter H. — Purdue Univ.
Organized by ASME

1:30 - 1:50 (I)
An Efficient Algorithm for the Generation of Multiple-Mode Input Shaping Sequences 373
Singer, Neil C. — Convolve, Inc.
Pao, Lucy — Univ. of Colorado
Singhose, William,
Seering, Warren — Massachusetts Inst. of Tech.

1:50 - 2:10 (I)
Combined Command Shaping and Inertial Damping for Flexure Control .....
Magee, David,
Cannon, David,
Book, Wayne — Georgia Inst. of Tech.
Lew, Jae — Battelle Pacific Northwest Lab.

2:10 - 2:30 (I)
Comparison of Input Shaping Techniques for Speed-Critical Multi-Mode Flexible Systems 379
Singhose, William — Massachusetts Inst. of Tech.
Pao, Lucy — Univ. of Colorado

2:30 - 2:50 (I)
Creating Time-Optimal Commands for Systems with Denominator Dynamics 385
Tuttle, Timothy D.,
Seering, Warren P. — Massachusetts Inst. of Tech.

2:50 - 3:10 (I)
Corrective Input Shaping for a Flexible-Joint Manipulator Performing Point-To-Point Motion 391
Kinceler, Roberto,
Meckl, Peter H. — Purdue Univ.

3:10 - 3:30 (I)
Use of Input Shaping Technique with a Robust Feedback Control and its Application to the Position Control of Surface Mount Machine 397
Chang, Pyung-Hun,
Park, Juyi — Korea Adv. Inst. of Sci. & Tech.

Salon VII

CCA-TM6

Laboratory Experiments in Control Applications

Chair: Auslander, David M. — Univ. of California Berkley
Co-chair: Kelkar, Atul G. — Kansas State Univ.
Organizer: Kelkar, Atul G.,
Organizer: White, Warren N. — Kansas State Univ.
Organized by ASME

1:30 - 1:50 (I)
An Interdisciplinary Control Systems Laboratory 403
Hagan, M.T.,
Latino, Carl D.,
Misawa, Eduardo A.,
Young, Gary E. — Oklahoma State Univ.

1:50 - 2:10 (I)
Laboratory in Microprocessor Control of Electromechanical Systems 409
Meckl, Peter H.,
Maguire, Daniel,
King, Galen — Purdue Univ.

2:10 - 2:30 (I)
Reconciling Programmable Logic Controllers (PLCs) with Mechatronics Control Software 415
Auslander, David M.,
Pawlowski, Christopher,
Ridgely, John — Univ. of California-Berkeley

2:30 - 2:50 (I)
Magnetic Bearing Experiment for Integrated Teaching and Research Laboratories 421
Paden, Brad,
Morse, Nancy,
Smith, Roy — Univ. of California, Santa Barbara

2:50 - 3:10 (I)
RHP Zeros in the Control of Resonant Systems ..... *
Rotea, Mario A.,
D'Amato, Fernando J. — Purdue Univ.

3:10 - 3:30 (I)
A Hydraulically Actuated Compound Pendulum 426
White, Warren N.,
Kelkar, Atul G.,
Fales, Roger C. — Kansas State Univ.

Director's

CCA-TM8

Control of Power Systems in a Deregulated Environment

Chair: Feliachi, Ali — West Virginia Univ.
Co-chair: Schlueter, R.A. — Michigan State Univ.
Organizer: Feliachi, Ali — West Virginia Univ.

1:30 - 1:50 (I)
Load Frequency Control in Hybrid Electric Power Markets 432
Christie, Richard D. — Univ. of Washington
Bose, Anjan — Washington State Univ.

1:50 - 2:10 (I)
On Load Frequency Control in a Deregulated Environment 437
Feliachi, Ali — West Virginia Univ.

2:10 - 2:30 (I)
Minimal System Regulation and its Value in a Changing Industry 442
Ilic, M.D.,
Yu, C.N. — Massachusetts Inst. of Tech.

2:30 - 2:50 (I)
An Optimal Power Delivery Problem in Deregulated Open Access Environment 450
Huang, Garng M.,
Hsieh, Shih-Chieh — Texas A&M Univ.

2:50 - 3:10 (I)
Structure of an Improved Intelligent Control for a Power System in a Deregulated Environment 456
Liu, S.,
Schlueter, R.A. — Michigan State Univ.

3:10 - 3:30 (I)
The Potential for Malicious Control in a Competitive Power Systems Environment 462
DeMarco, Christopher L.,
Sarlashkar, Jayant V.,
Alverado, Fernando — Univ. Of Wisconsin-Madison

Salon II

CCA-TP2

Manufacturing Systems and Machine Tool Control

Chair: Krogh, Bruce — Carnegie Mellon Univ.
Co-chair: DeBra, Daniel B. — Stanford Univ.

4:00 - 4:20
Design of a Robust Thickness Controller for a Single-Stand Cold Rolling Mill 468
Hwang, Gun,
Ahn, Hyun-Sik,
Kim, Do-Hyun — Kookmin Univ.
Yoon, Tae-Woong — Korea Univ.
Oh, Sang-Rok,
Kim, Kwang-Bae — Korea Inst. of Sci. & Tech.

4:20 - 4:40
A Fuzzy Approach to Optimize Manufacturing Processes with No-Wait Constraints 474
Macchiaroli, Roberto,
Molè, Salvatore,
Riemma, Stefano — Univ. degli Studi di Napoli

4:40 - 5:00
Block Box Identification and Predictive Control of High Speed Machine Tools 480
Del Re, Luigi,
Kaiser, O.,
Pfiffner, R. — ETH Zürich

5:00 - 5:20
Model Predictive Fluid Temperature Control for the Quiet Hydraulic Turning Machine 486
Huang, Jih-Jenn — Chung-Shan Inst. of Sci. & Tech.
DeBra, Daniel B. — Stanford Univ.

5:20 - 5:40
Hybrid Real Time Adaptive PID Control System for Turning 492
Carrillo, F.J.,
Haddouche, K.,
Rotella, F. École Nat. d'Ingénieurs de Tarbes ENIT

Salon III

CCA-TP3
Nonlinear Systems II
Chair: Recker, Darrel Ford Motor Co.
Co-chair: Taylor, David G. Georgia Inst. of Tech.

4:00 - 4:20
Approximate Output Tracking Control for PWM Systems with Unacceptable Zeros 498
Al-Numay, Mohammed,
Taylor, David G. Georgia Inst. of Tech.

4:20 - 4:40
Nonlinear Control of Competitive Mixed-Culture Bioreactors via Specific Cell Adhesion 504
Kurtz, Michael J.,
Henson, Michael A.,
Hjortso, Martin A. Louisiana State Univ.

4:40 - 5:00
H_∞ Position Control of Hard Nonlinear Systems 510
Choi, Chin Tae RIST
Kim, Jong Shik Pusan Nat. Univ.

5:00 - 5:20
Robust Gain-Scheduled Control of a Class of Nonlinear Parameter-Dependent Systems: Application to an Uncertain Inverted Pendulum 516
Dussy, Stéphane,
El Ghaoui, Laurent École Nat. Super. de Tech. Avançées

5:20 - 5:40
Applications of the General Root-Locus Theory for Nonlinear Systems 1108
Rimsky, G.,
Bochkareva, L., Academy of Sciences of Belarus
Mazurenko, E. Buelorussian State Univ. of Inf. and Radioelect.

Salon VII

CCA-TP6
Robust Control I
Chair: Dailey, Lane Boeing Corp.
Co-chair: Javaharian, Hossein General Motors Corp.

4:00 - 4:20
On Robust H_∞-Based Control Design for Flexible Joint Robots 522
Moghaddam, Majid M. Univ. of Toronto

4:20 - 4:40
Robust Nonlinear Control of pH Processes 528
Smith, Brian E.,
Kravaris, Costas Univ. of Michigan

4:40 - 5:00
Stability Robustness Applied to the Design of Electrohydraulic Servovalve 534
Lee, Jae-Cheon,
Misawa, Eduardo A.,
Reid, Karl N. Oklahoma State Univ.

5:00 - 5:20
A Robust Controller for Manipulator Driven by an Artificial Muscle Actuator 540
Cai, Dawei,
Yamaura, Hiroo Shinshu Univ.

5:20 - 5:40
Robust Control and Identification of Robots: Theory and Applications 546
Lyashevskiy, Sergey,
Chen, Yaobin Purdue Univ. at Indianapolis

Director's

CCA-TP8
Identification II
Chair: El-Sherief, Hossany TRW Strategic Systems Division
Co-chair: Hung, Steve Ford Motor Co.

4:00 - 4:20
Estimation of Vehicle Lateral Velocity 552
Farrelly, Jim,
Wellstead, Peter UMIST

4:20 - 4:40
Parameter Identification for a Triaxial Shaker System 558
Dougherty, John J.,
El-Sherief, Hossny TRW Systems Integration Division

4:40 - 5:00
Sensitivity Analysis for Parameter Identification Using Optimal Control Indices 564
Mehta, Amish,
Kaufman, Howard Rensselaer Pol. Inst.

5:00 - 5:20
Control-Relevant Identification of an Ill-Conditioned Distillation Column 570
Böling, J.M.,
Häggblom, Kurt E. Åbo Akademi Univ.

5:20 - 5:40
Intersample Output Estimation with Multirate Sampling .. 576
Ramachandran, Parthasarathy,
Young, Gary E.,
Misawa, Eduardo A. Oklahoma State Univ.

Salon I

ASME-WA1

ASME Panel
9:30 - 11:30

Control System Needs of the Automotive Industry

Chair: Hedrick, J. Karl — Univ. of California, Berkeley

An Overview of Academic Automotive Research in the US
Hedrick, J. Karl — UC Berkeley

Challenges for Control System Designers
Rado, William — Ford Motor Co.

Challenges Presented by Integrated Vehicle Control Systems
Browalski, Edward — General Motors Corp.

Issues in Analysis and Simulation for Vehicle Control Systems
Shrivastava, Prakash — General Motors Corp.

Control Applications in Chassis Electronics
Rhode, Doug — Ford Motor Co.

Salon II

CCA-WA2
Intelligent Controls
Chair: Pilutti, Thomas E. — Ford Motor Co.
Co-chair: Porche, Issac — Univ. of Michigan

9:30 - 9:50
A Decentralized Scheme for Real-Time Optimization of Traffic Signals 582
Porche, I., Sampath, M., Sengupta, R., Chen, Y.-L., Lafortune, Stephane — Univ. of Michigan

9:50 - 10:10
CAPC: An Implementation of a Road-Departure Warning System 590
LeBlanc, David J., Johnson, Gregory E., Venhovens, Paul — Univ. of Michigan
Gerber, Garth, DeSonia, Robert — Envir. Research Inst. of Michigan
Ervin, Robert — Univ. of Michigan Transportation Research Inst.
Lin, Chiu-Feng, Ulsoy, A. Galip — Univ. of Michigan
Pilutti, Thomas E. — Ford Research Lab.

10:10 - 10:30
A Control-Oriented Approach to Water Quality Modeling of Drinking Water Distribution Systems 596
Zierolf, Michael L., Polycarpou, Marios M., Uber, James G. — Univ. of Cincinnati

10:30 - 10:50
Expert Rule Based Time Optimal Control of Crane Loads 602
Moon, Myung S., VanLandingham, Hugh F., Beliveau, Yvan J. — VPI and State Univ.

10:50 - 11:10
Genetic Control of a Ball-Beam System 608
Marra, M.A., Boling, B.E., Walcott, Bruce L. — Univ. of Kentucky

11:10 - 11:30
A Dual Neural Network Architecture for Linear and Nonlinear Control of Inverted Pendulum on a Cart 614
Biega, Victor, Balakrishnan, S.N. — Univ. of Missouri-Rolla

Salon III

CCA-WA3
Motor Control I
Chair: Schoenwald, David A. — Oak Ridge Nat. Lab.
Co-chair: Vedagarbha, Praveen — Clemson Univ.

9:30 - 9:50
Adaptive Control for a Class of Induction Motors via an On-Line Flux Calculation Method 620
Vedagarbha, Praveen, Dawson, D.M., Burg, T. — Clemson Univ.

9:50 - 10:10
On the Experimental Robustness of a Passivity-Based Controller for Induction Motors 626
Espinosa-Pérez, G., Campos-Cantón, I. — Univ. de Mexico
Ortega, Romeo — Univ. de Compiègne

10:10 - 10:30
Robust Stability of PWM Buck DC-DC Converter 632
Pujara, L.R., Kazimierczuk, Marian K., Shaheen, ASM Nazirul I. — Wright State Univ.

10:30 - 10:50
Optimal Rotor Flux Control for Induction Motors 638
Farruggio, D. — Swiss Federal Inst. of Tech. (ETH)
Müller, Markus — Communication & Control CHCRC.C1

10:50 - 11:10
Recursive Parameter Identification of an Induction Machine Using a Nonlinear Programming Method 644
Coirault, Patrick, Trigeassou, J.C., Kérignard, D., Gaubert, J.P. — École Super. d'Ingénieurs de Poitiers

11:10 - 11:30
Analysis of Sliding Mode and PWM Control for a DC Motor 650
Mudunuri, M.K. — South Carolina State Univ.
Schoenwald, David A. — Oak Ridge Nat. Lab.